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The DRILLER

THE JOHN CREERAN
MAY 7 1946
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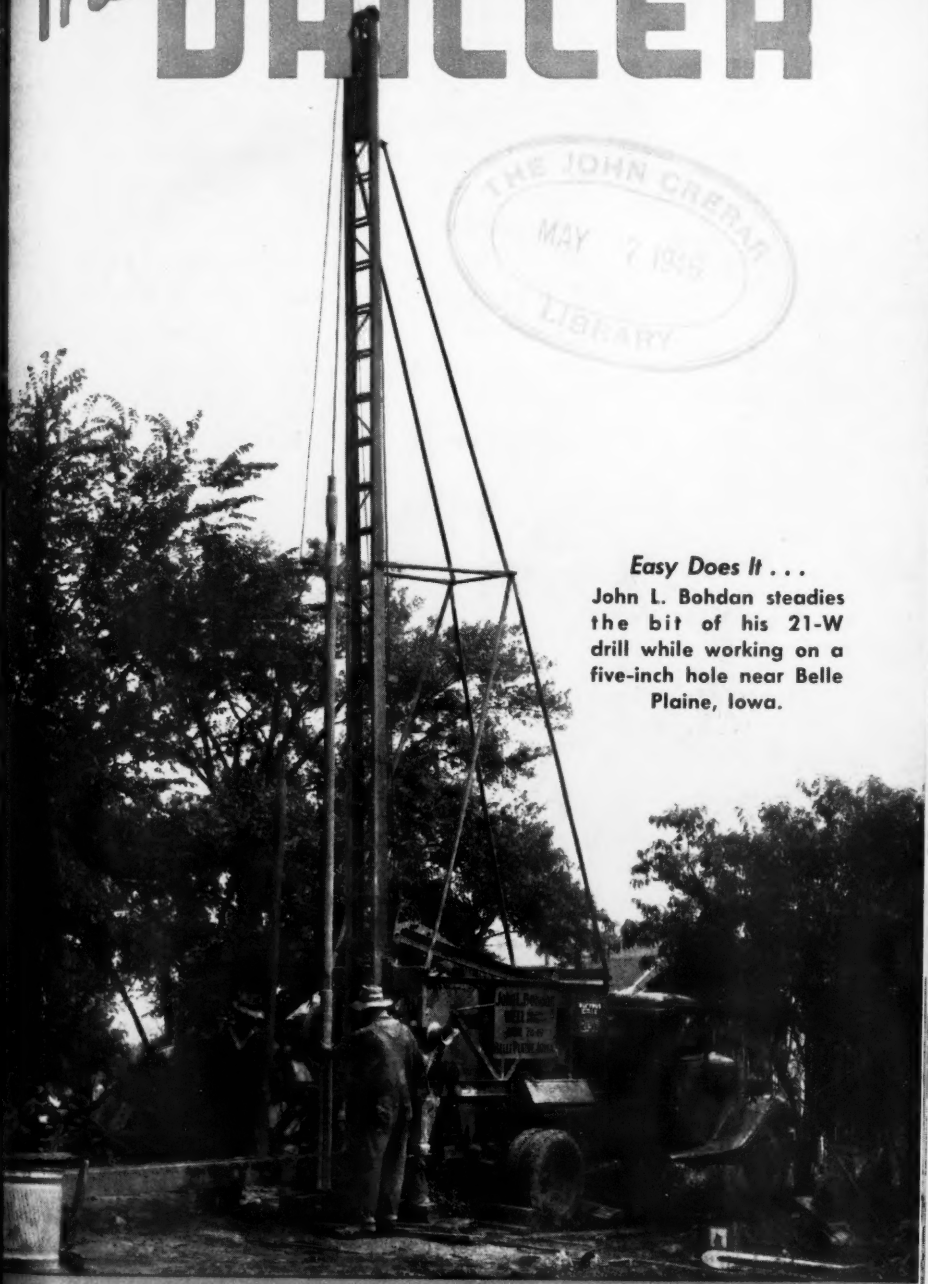

Easy Does It . . .
John L. Bohdan steadies the bit of his 21-W drill while working on a five-inch hole near Belle Plaine, Iowa.

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VOLUME 20 MAY, 1946 NUMBER 5

THREE ROUTES *to Bigger Well Profits*

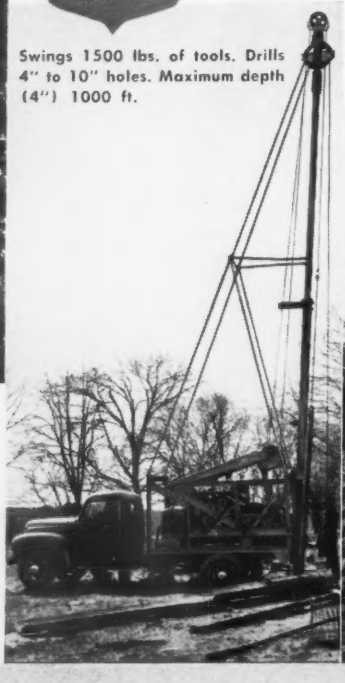
No matter how expertly it is designed, no machine can i itself make a drilling business successful. There is no sub stitute for knowledge of formations or for drilling exper ence. But added to such knowledge and such experienc high quality equipment does much to make well profi soar. Check with the outstandingly successful drillers every where and you will be amazed at the high percentage o them who operate Bucyrus-Erie rigs exclusively. They'll b quick to tell you that a substantial part of their succes is directly attributable to the hard hitting, long life dril ing performance of their machines . . . . that Bucyrus-Erie are routes to bigger profits!

BUCYRUS ERIE **24-L**

Swings up to 3000 lbs. of tools. Drills holes up to 20" dia. Maximum depth (finishing 4" or 5") 1500 ft.

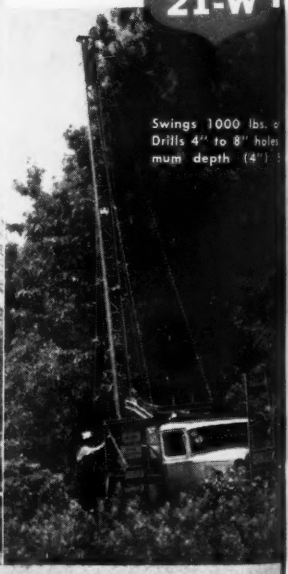
BUCYRUS ERIE **22-W**

Swings 1500 lbs. of tools. Drills 4" to 10" holes. Maximum depth (4") 1000 ft.



BUCYRUS ERIE **21-W**

Swings 1000 lbs. o Drills 4" to 8" holes mum depth (4")



Drilling and Fishing Tools

- Finest Workmanship
- A Complete Line
- Prompt Service
- Best Material

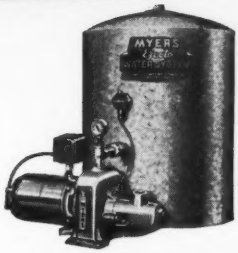
16W45

BUCYRUS-ERIE CO.

SO. MILWAUKEE, WI
EVANSVILLE, INDIA

AN abundance of fresh, clean water is the mark of a good well. Get credit for a good drilling job by recommending a quality Myers Water System with ample capacity for all needs.

From the complete Myers line of *Ejecto* and Plunger Type water systems, you can select exactly the right type and size to meet every requirement.



New Myers "H" Series *Ejecto*. Convertible for either shallow or deep wells.

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Dept. F-7, Ashland, Ohio

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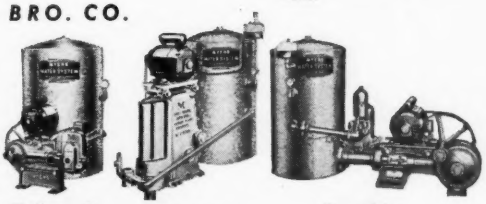


Shallow well plunger type system

Deep well plunger type system

Heavy duty shallow well system

WATER SYSTEMS POWER AND HAND PUMPS CYLINDERS ACCESSORIES

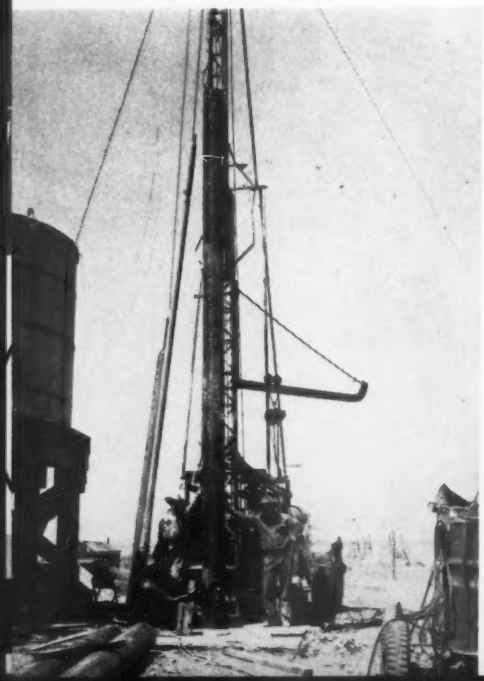
"Stump Pulling" Perry— Fishing Expert

"The best fishing expert in Lincoln County" has been called to several unusual jobs over the State of New Mexico. Pulling dropped pipe or cottonwood stumps—it's all in a day's work for Elzy Perry, driller for 38 years, and his group of sons.

ONE of the most unusual jobs in Elzy Perry's 38 years in the well drilling business involved pulling and loading with his Bucyrus-Erie 24-L rig, a large number of huge cottonwood stumps on his own farm in New Mexico's Ruidoso Valley. The trees were four feet in diameter and 50 to 60 feet tall and were removed by stringing 2x2 blocks from one stump to another and rigging a line to the casing reel of the drill rig.

Elzy Perry says that as he tightened the line the ground would crack at least ten feet in diameter around the stump, finally giving way. Some of these stumps weighed as much as 4000 lbs. and after being pulled, were loaded on the service truck by the drill. Mr. Perry also cleared about 16 acres of large apple trees in this way.

• An army camp close to the atomic bomb testing site furnished the locale for this picture. At the controls of his rig is George Perry who is assisted by his helper, Harold Cox. The welder, a G.I., is Ralph Manning.



Elzy Perry (principal owner of Elzy Perry and Sons, Glencoe, New Mexico) is a specialist in drilling of farm and irrigation wells throughout Lincoln and Socorro Counties. His wells range from 5 to 10 inches in diameter and from 200 to 1000 feet deep.

His three rigs, Bucyrus-Erie 21-W, 33-W, and 24-L, piled up footage of 14,000 in 1944. Most of the wells are for cattle and sheep ranchers who sometime require as many as eight wells on one ranch.

A tough problem which Elzy Perry and Sons often have to face is the matter of pulling dropped pipe out of wells varying in depth from 500 to 1000 feet. Oftentimes a rancher starts to pull pipe out of his well and gets about half of it out when he loses control and drops the remainder back into the hole.

Then Perry usually gets a tough fishing job.

According to Perry, dropping the pipe that far breaks almost every joint at the coupling, making removal extremely difficult. He has had to fish some pipe which has been dropped with sucker rods inside, sometimes has fished out three-inch pipe with as many as three rods stuck into it side by side. This is one type of job he says he does not like but nevertheless is called on frequently to do.

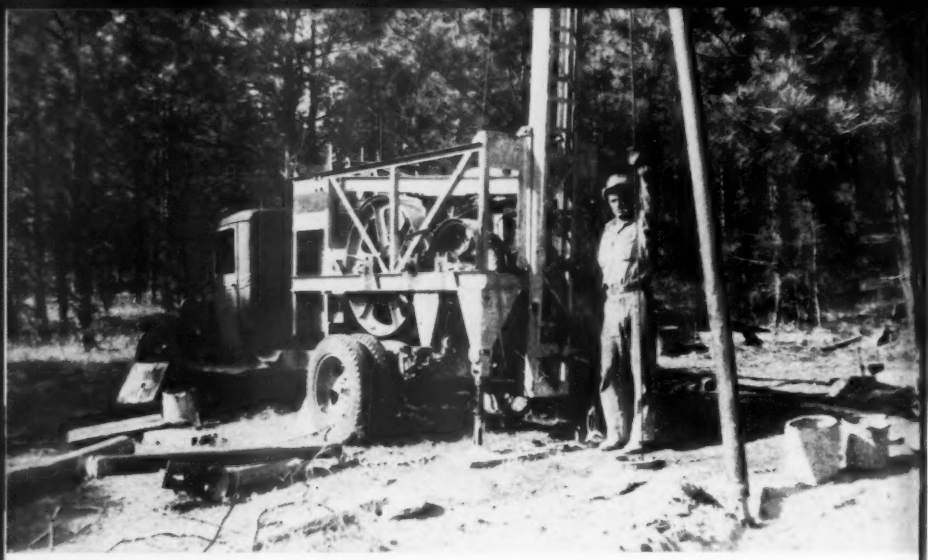
About 50% of these wells, in Perry's experience, can be saved by fishing out the dropped pipe. The other 50% often have to be redrilled. In a typical job of this sort the Perrys fished nine joints of pipe out of an open hole in six days and no more than two joints were found with couplings intact.

The Perrys have found it profitable to rent most of their fishing tools except the most common ones, from a supplier at Roswell, New Mexico, who has "every kind and size of tool."

• Don (next to youngest son) and father Elzy Perry and (bottom) George Perry (oldest son) pose with the 24-L which has just pulled this four-foot diameter, 4000-pound cottonwood stump and loaded it on the pickup truck.

• Perry's 33-W has just completed a 6½-inch well which went to 600 feet and yielded 12 gpm, at Capitan, New Mexico. A 14-foot Sampson windmill has been installed for Rancher Ben Payne.

Elzy Perry and Sons have drilled a great number of highly successful ranch wells in their 38 years of operation. One of the few freaks—which they have never been able to explain—was a 6½-inch well which was drilled 100 yards from a 600 foot dry well. A strong flow of water



• Euel Ross, son-in-law to Elzy Perry, drilling a well for a summer resort at Ruidoso, New Mexico.

was found at only 24 feet which was put on test for eight hours, yielded 35 gallons per minute.

Extremely pleased with this yield, the Ancho rancher commissioned Perry to install a siphon system. The well gave abundant water for three months, and suddenly went dry and eventually proved of no further use. Perry then drilled a 6½-inch well to 150 feet a few yards away which brought in 5 gallons per minute. It is still a successful producer. The Perrys usually find water in sand rock and sometimes in coarse and broken lime. They have found no definite water level but have usually found water in varying veins and crevices.

During the war, the Perrys drilled several wells for the U. S. Army to supply depots and prison camps, drilling in almost every kind of formation—lime, gypsum, sand rock, and red clay. Included in their work for the army was a strictly "hush-hush" project—the drilling of a well for an army camp close to the testing site of the atomic bomb. Started with 12-inch casing and completed with 8-inch pipe, the well was good for a capacity of 100 or more g.p.m.

Elzy Perry's rigs have been used for many unconventional purposes such as stump pulling, pile driving, and even one time for lifting a 7-RD Caterpillar tractor out of the mudhole where it had driven deep enough for mud to run in the radiator, putting the "Cat" out of commission.

The Perrys have seldom found it necessary to advertise, and always obtained all the business they could handle through recommendations of past customers. They have established the commendable reputation of never having failed to produce water. This has sometimes meant that they have had to drill a second or third hole, but a producing well has always been obtained for the customer. Many Lincoln County customers have told Perry, "I'll wait for you if it takes a year or more for you to get to me."—and the firm finds most of its jobs are lined up months in advance.

Elzy Perry has six sons and the oldest, George Perry, has been drill-

• Perry's 24-L test pumping the 6½-inch 24-foot well drilled at Ancho, New Mexico, for rancher Bryan Hightower. Drilled on a hill, water from this well later flowed by gravity through a siphon installed by Driller George Perry. John Hightower, son of the rancher, is at left.

ing with his father for the past eight years and is a partner in the business. Three sons, Leroy, Elzy Jr., and Lloyd, were drillers and helpers before the war and are now overseas with the Navy and Marines. The two youngest sons are still in school but want to become well drillers as soon as they can.

Mr. Perry's son-in-law, B. E. Nasker, has been a partner in the business and an active driller for three years. He is now in charge of the Bucyrus-Erie 33-W.

Worked Single-Handed

The Perrys experienced considerable difficulty in obtaining sufficient help during the war years, since eight of the boys who had worked for him went to the armed forces. Many times he has had to go to work single-handed; haul water, dress bits, do his own cooking and all other work alone, while drilling a well which was often twelve miles from the nearest ranch house.

Perry says all the boys want to run Bucyrus-Erie rigs and he anticipates the need for several of these since he feels the water well business is "just getting started" in New Meixco.

The success story of Elzy Perry and Sons indicates the type of business which can be established through reliable, painstaking, careful work. Their work has been so well received that they are now the largest drillers in their part of New Mexico—virtually without competition.

• New Mexico ranchers (and drillers) get very little work done during the 10-day hunting season, says George Perry (right) shown after a hunting trip near a well site. At left is his partner and brother-in-law, B. E. Nasker.

Drillers In Britain Aided War Effort

This article was arranged especially for THE DRILLER by *British Information Services* to give our readers a picture of the drilling outlook in Great Britain.

• "Rigging up" one of the portable rigs operated by Duke and Ockendon Ltd., of Victoria St., Westminster. Duke and Ockendon have a number of heavy rigs for large and deep holes.

By
F. H. EDMUNDS
Water Section, Geological Survey of Great Britain

DRILLING for water has been one of the lesser-known industrial activities which, under conditions of great difficulty, contributed their full quota to Britain's war effort.

Drilling in Britain requires a high degree of technical skill, on account of the varied nature of the geological structure of the country. For instance, the geological formations of the whole of the Continent of America are epitomized in this island, and well drillers must not only be prepared to meet all types of rock, from clays and shales to limestones and granites within a small area, but also, in many districts, in a single hole of a few hundred feet depth. Difficulties on this score, however, are minimized by a close liaison between the Geological Survey of Great Britain (a branch of the Government's Department of Scientific and Industrial Research) and the well-drilling industry, whereby well-drillers, most of whom for many years have furnished the Geological Survey with records of their boreholes, may obtain without charge an estimate of the nature of the rocks to be expected at a site,

and the probable depth necessary to bore.

Some 250 firms, large and small, are engaged in drilling in Britain, but probably at least 70 per cent of the total volume of work is carried out by a group of some twenty larger concerns, who are capable of drilling for water to depths of 1,500 ft. or more, although few holes actually go below 1,000 ft.; while 300 ft. is an average. Holes of about 12 to 30 inches in diameter are common, but the majority are of less diameter. Rotary rigs are available to drill up to 6 ft. diameter. The smaller firms, which constitute the great majority in point of numbers, normally drill holes from 2 to 6 inches diameter to depths of a few hundred feet, for firms, isolated houses, etc.; many of these drillers are in fact agricultural engineers, who undertake drilling small wells as part of their agricultural work.

Firms Form Nucleus

On the outbreak of World War II, the industry immediately furnished to the British Army a number of complete well-drilling units, centered around a nucleus formed by four of the large firms. Well-boring engineers became the officers, and skilled operatives the non-commissioned officers. Only the unskilled laboring element was provided from outside the industry's ranks. Some of these men were early in France, and saw Dunkirk, others went to Crete, and others again to Egypt, North Africa and Italy.

From the outbreak of war, therefore, the drilling industry found itself short of skilled labor. Coincident with this deficiency, demands arose for boreholes to meet the water supply needs for new army depots, aerodromes, searchlight stations, factories, hospitals, etc. in all parts of the country. The guiding principle of the various Service and Civil Departments was to connect up to an existing piped water supply wherever this was feasible, and the increased demands were then met as far as possible by stepping up rates, or by lengthening hours of pumping, or by both means. Where necessary, existing water-works wells were extended to meet the enhanced requirements.

While the urban areas of Britain are well served by piped supplies, many rural areas are far from a water main, and special provisions had to be made for camps, airfields or hospitals that were to be constructed in country districts. In numerous instances supplies were taken from surface sources, but many sites were planned to be dependent on underground water.

The Army utilized its own well-drilling units, in Britain as well as overseas, the majority of its boreholes being put down under the supervision of an officer who, after considerable experience of oil drilling in America and the Caucasus, had been for some years on the engineering staff of one of the larger

(Continued on page 19)

• Part of a core 6½ feet in diameter from a hole drilled by C. Isler and Co., Southwark St., London. Messrs. Isler have operated rotary tools up to ten feet in diameter, but the pictured core is the largest diameter core hitherto extracted in one piece in Great Britain.

The DRILLER

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Reason For New Back Cover Feature

IN keeping with its policy of self-improvement, THE DRILLER inaugurated a new feature for its back cover beginning with the April issue. We hope you noticed and liked the table of contents that appeared there for the first time.

The reason for this change was not only to make best possible use of the available space, but to make it easier for those of you who file or save your copies for future reference—as many of you do.

As you probably know, THE DRILLER is always pleased to receive any comment or criticism from you readers reflecting opinions in regard to the type and presentation of the material we select for publication. So if you have any suggestions that you think we could use, write and let us know. This is your magazine.

Levels Were Normal

GROUND water levels for February continued to average normal or above throughout most of the states with a few exceptions according to the recent U. S. Department of the Interior and Geological Survey bulletin.

Test wells in the Pennsylvania-New York area showed low tables but this was no departure from the norm. Continued low tables in Arizona and New Mexico reflect repeated heavy usage placed on the underground reservoirs in those areas.

The runoff picture for the nation was complicated by floods in the southern states and excessive runoff in parts of the West Central States from Arkansas and eastern Oklahoma to Minnesota.

Drill Rig On Guam

• Further evidence of the importance of water well drilling equipment in the war is shown by snapshot of Marine Lieutenant Walter M. Tammi as he points to a 24-L that was used on the island of Guam.

Peerless Vertical Centrifugal Pumps

FOR SHALLOW LIFTS

PEERLESS PUMPS

100 to 5000 g. p. m.
15 to 100 foot head

● Peerless Vertical Centrifugal Pumps are intended for general pumping purposes.

They are built in both the Close-Coupled and Submerged types. The Submerged type is furnished with either top or bottom suction. Direct connected electric motor, steam turbine or engine drive, either direct or through right angle gear.

These pumps are successfully applied to sumps or drainage or wherever it is necessary to move large quantities of water at comparatively low lift.

Installation space is reduced to a mininum, of paramount importance in industrial installations.

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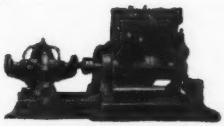
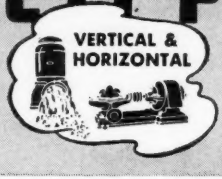


PEERLESS PUMPS

PEERLESS PUMP DIVISION
Food Machinery Corp.



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NEWS OF THE MONTH

Michigan To Hold Convention In June

THE dates for the annual convention of the Michigan Well Driller's Association have been announced as June 14 and 15 by Harold Armstrong, chairman of the convention.

The gathering will be held in Lansing, Mich. at the Hotel Olds where Armstrong has arranged for the large ballroom to be available to manufacturers, jobbers, and dealers for display purposes. A lot near the hotel has also been secured for those who wish to set up well machines and other heavy equipment.

The program, now being formulated, will be featured by the annual banquet with a floor show which will be held on the evening of June 15.

Hoosiers Hold 15th Annual Convention In Indianapolis

MARKED by one of the largest attendances in recent years, the Indiana Well Drilling Contractors Association held their fifteenth annual convention in Indianapolis on March 28 and 29.

The first day's program included talks by Fred H. Klare, U. S. Geological Survey, and C. H. Bechert, Indiana State Conservation Department. Concluding the initial day's schedule was the annual banquet in the evening which was featured by a well-received floor show.

Talks by A. O. Fabrin, Chief Engineer of Layne Bowler Inc., and E. W. Bennison, Office Engineer for E. E. Johnson Inc., delivered on the morning of the final day were followed by the election of officers, and the Hoosiers elevated their last year's Vice-president, Willie McCarty, Greensburg, to President, replacing H. R. Lamb, Carmel.

Other officers elected were H. K. Carr, Greentown, Vice-president, and W. Gordon, Cherubusco, Secretary. Selected as Directors to continue with N. E. Gunderson, Mishawaka, were Clifford Busby, Anderson, 3-year term, and R. L. Clark, Indianapolis, 2-year term.

Missouri Meet Featured By Talks On Developments

NEW developments in the water well drilling industry featured sessions of a two-day convention held in St. Louis, April 8 and 9, by the Missouri Water Well Drillers Association.

Among topics given special attention were: "Electrical Well Logging," discussed by Carl A. Bays, Illinois Geological Survey, Urbana, Illinois; "Acidizing of Water Wells," presented by R. H. Winn, Halliburton Oil Well Cementing Co., Flora, Illinois; "Rotary Drilling and Well Cementing in Southern Missouri," treated by D. F. Weldon, Weldon Well Company, Cape Girardeau; "Development of Alluvial Water Supplies," given by L. M. Heckman, Layne-Western Co., Kansas City.

Stressing cooperation between drillers and his office, E. L. Clark,

Missouri State Geologist, Rolla, discussed the work of the state survey, and L. E. Ordelheide, Missouri State Board of Health, Jeffersonville, spoke on the post war activities of his branch. Wm. A. McEllhiney, J. P. Miller Artesian Well Co., Brookfield, Illinois, gave the convention a description of the work of the neighboring Illinois Water Well Drillers Association.

R. A. Foster, Harrisonville, was elected 1946 President to succeed T. Flamm. Kimmswich. D. F. Weldon, Cape Girardeau, was elected Vice President while the posts of Treasurer and Secretary went to N. Haverstick, DeSoto, and C. S. Wise, Jr., St. Louis, respectively. Keith Anderson, Rolla, was selected as Service Secretary. Directors elected were: Ben Dake, Mountain Grove, L. J. Kessler, Troy, and J. Sewell, St. Louis.

A banquet and floor show highlighted convention entertainment.

Montana Drillers To Organize

AFTER meeting with Montana State Board of Health on March 22 and 23, a representative group of Montana water well drillers arrived at the opinion that it would be benficial to all those connected with the water well industry in that state if the wellmen were formed into a state association patterned in the manner of existing state groups of this type.

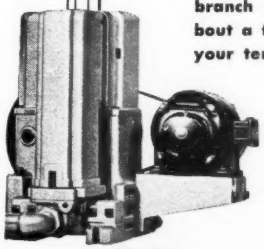
At the conclusion of the discussions, it was decided to form a Montana Well Drillers Association. M. M. Ulrich, Missoula, was appointed chairman of the group whose purpose is to organize the association, and R. C. Simpson of Malta, THE DRILLER'S informant, was selected as secretary-treasurer of the body.

Pencil Test

Illustrates Quiet Smoothness of Monitor Automatic Water System

The Monitor Automatic Deep Well Water System runs so smoothly you can balance a pencil on the case while the motor is running. Demonstrate that to your customer and you have a real salesmaker.

All moving parts of the Monitor Automatic system are precision-machined like an automobile motor. Ball and roller bearings throughout plus new "hollow-plunger" oil pump eliminates starting drag. Beautifully designed *Iron Vault* case muffles sound. Write your nearest Baker branch and ask about a franchise for your territory.



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SILENT FLOW

AUTOMATIC WATER SYSTEM

BAKER MFG. CO., EVANSVILLE, WISCONSIN

BAKER MFG. CO.: Minneapolis, Minn.; Madison, Wis.; Fort Dodge, Ia.; Cedar Rapids, Ia.; Omaha, Neb.; Kansas City, Mo.; Enid, Okla.; Hutchinson, Kansas; **BAKER MFG. LTD.:** Winnipeg, Canada; **AXTELL CO.:** Fort Worth, Texas; Amarillo, Texas; Lubbock, Texas; San Angelo, Texas.

New Power Machine For Threading Pipe Now On Market

A NEW portable power machine for the threading pipe and bolts—the No. 502 "Pipe Master"—has been announced by the Oster Manufacturing Co., Cleveland, Ohio.

According to the company news release, the machine can cut-off, ream, and thread a two-inch pipe in 73 seconds which includes the time of chucking and unchucking the machine. A geared head, universal, reversible, variable speed motor and switch for light socket operation is concealed in the case or housing, and operates on 110 volts, A. C. or D. C.

Standard pipe size range is one-

fourth to two-inch, but when equipped with a special, universal drive shaft, the machine has ample power to thread pipe from 2½ to six-inch diameter inclusive. Regularly furnished as a complete machine for bench use, the unit can be carried by two men.

A JENSEN WILL NEVER LET YOU DOWN

It's mighty discouraging to drill a good water well and then have the owner dissatisfied because of the pumping unit.

That's why more and more drillers are recommending JENSEN for wells 100 feet and deeper. Drillers know that a JENSEN, because of rugged construction and dependability, will never let them or their customers down.

Get the facts and figures by writing us NOW. Ask for Bulletin 26.

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Michigan Local Treats Ladies

AN interesting experiment that produced results recently was an idea by Local No. 5 of the Michigan Well Driller's Association to promote interest in monthly meetings by urging members to invite their wives to accompany them to a dinner in conjunction with the meeting.

THE DRILLER'S informant, A. B. Cogan, president of the local, writes that the "lady drillers" enjoyed themselves at the gathering to the extent that they planned a steak dinner for the next meeting. Guests of the local at this first "social meeting" were C. W. Kinsey and Harold Armstrong, president and secretary respectively of the state organization, who drove 145 miles with their wives to attend the meeting.

W. L. Thorne

The many friends of W. L. Thorne, Des Plaines, Illinois, were saddened to learn of his death in that city on March 30, 1946.

Mr. Thorne, who was well known by a great many connected with both the oil and water well industries in the Midwest, was active as a contractor in the field for almost 60 years. Born March 4, 1871, Mr. Thorne entered the well drilling business at the age of 16 and during his long period of work built up an enviable trade and made a host of friends. He is survived by his wife and two sons, Lester H., also a drilling contractor, and W. L. Jr.

Wire Rope History

CELEBRATING their fiftieth year as manufacturers of wire rope, the Macwhyte Company in their recent issue of the folder, "Ropeology," gives a compact outline history of the evolution of wire rope making. Illustrative pictures accompany the text.

Profitable shallow well drilling calls for Macwhyte "Hi-Lastic," because "Hi-Lastic" gets more work done quicker. It strikes harder, faster blows . . . keeps the bit turning better on all types of formation . . . helps reduce tendency for the hole to get out of round, and for the bit to channel. "Hi-Lastic" is internally lubricated for longer life. No manila cracker needed.

For profitable deep well drilling use Macwhyte Standard Cable-Tool Lines. Just the right elasticity to strike long, hard, sharp blows.

For fast bailing use Macwhyte Sand Lines. Coarse laid (6 x 7) or soft laid (6 x 19), Mild Plow Steel. 826 R

Get the CORRECT line for your equipment from

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2939 Fourteenth Avenue, Kenosha, Wisconsin, or any authorized Macwhyte Distributor or Mill Depot

Driller Breaks Jinx of Carisa Plains

H. W. Bence of Santa Margarita, California, was nervous when he started on a job to produce water where all other drillers had previously failed.

• This view of Bence's rig was shot at Salinas Valley, Calif., while he was drilling an irrigation well for the California Orchard Co.

CALIFORNIA drillers shook their heads when Carisa Plains was mentioned. That land was a driller's graveyard — until H. W. Bence came along and drowned the jinx with 600 gallons of water per minute from a successful 502-foot well.

Bence, from Santa Margarita, California admits that he was a little nervous when he first set up his rig to begin the job in April of 1945, especially when the farmer he was drilling for wanted him to go down 500 feet or more. Other drillers had tried putting down some deep holes but failed. Usually they got their pipe stuck after getting down to a depth of 200 to 300 feet.

With the aid of a helper, Bence first set his 16″ x 16″ steel eye beam anchors nine feet deep in hard clay and also put in his two eight-inch jacks. These primary operations took five days. Now, Bence was ready to begin on his 16-inch hole. For the first 60 feet he drilled with solid tools strung on the cable, then at that point he switched over to a mud scow.

Work went smoothly until a depth of 326 feet was reached and bang! Bence hit what he calls "concrete." "You break a chunk of it off and it looks just like a piece of pavement," he added. Fortunately, the hard strata was only two-and-a-half feet thick, yet it took much time and patience on the part of the drillers to push their pipe through this difficult layer which might have stopped operations.

After passing this obstacle, the en-

suing formations varied from thin layers of sandy clay, pure clay, gravel-clay to a few more seams of "concrete." Bence had the pipe following the mud scow as he drilled, and at times when meeting these hard layers, the jacks had to take a pressure of 2,000 pounds to force the casing through.

At 502½ feet, the pipe was embedded in hard brown clay and the first successful well in Carisa Plains, an area of 100 miles long and 15 miles wide, was down, and producing a volume of water that is remarkably good for that section of the country which has an elevation of 2,200 feet above sea level. The entire job took 29 days including the four used for casing.

The rig that Bence used on this job was what is called a California Commercial. Besides this outfit, Bence also has a 50-B Armstrong and a small model 14 Armstrong which have given him creditable service. With orders already scheduled for weeks ahead, the Californian is having no difficulty in securing jobs.

New Folder On Tap Extractors Issued

OF INTEREST to drillers who have their own machine shops is the announcement by the Walton Company, Hartford, Connecticut, of their new folder covering the complete line of Walton Tap Extractors. Listed for the first time are ten tap extractors designed especially for quick and easy removal of broken pipe-threading taps.

The new folder emphasizes simplicity of operation, immediate delivery from stock, and free reconditioning service. Besides pipe taps, there is a complete range of extractor sizes for standard hand taps and machine screw taps.

Catalog Issued On Buda Diesels

THE Buda Company, Harvey, Ill., has recently published a 12-page catalog featuring its new line of "One-Sixty-One" Series Diesel engines for Automotive, Industrial, and Marine service. Illustrations show 1, 2, 3, 4, 6, and 8-cylinder models, ranging from 15 to 300 horsepower. The heavy-duty six and eight-cylinder diesels are available in both standard and supercharged models.

Material in the catalog includes pressure lubrication data—helpful to drillers owning rigs powered by this type engine, a discussion of Buda slow pressure combustion system, engine data table and other discriptive information relative to the application of the new Buda Diesels to power needs throughout industry.

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FROM THE MAILBAG

This page is open to any of our readers having questions to ask relating to drilling, driving pipe, dressing bits, etc. All letters will be answered promptly by experienced drillers and engineers who are qualified to give intelligent advice on these subjects. We will publish as many letters of general interest as space will permit. Address: The Driller, South Milwaukee, Wis.

Sirs:

I operate drilling rigs in connection with my mercury mining business. Atop a sizable hill I have a good spring. The hill is some 500 feet above the valley level. The spring will supply enough water to flow, full choke, an 8" stream through an 8" pipe. The hill slopes at a 45 deg. angle. How much weight (weight of the water coming down the 8" pipe) will friction cause this water to lose on its way down the 8" pipe from the spring atop the hill to the bottom, 500 feet below? I desire this information since I expect to install an electric turbine at the bottom of the hill and power it by the water from the spring. How much friction is to be expected in an 8" pipe lying horizontally where fresh water is passed through it two miles distant?

Ark. **W. F. H.**

(Reply through courtesy Illinois State Water Survey Division)

Many observations have been made upon pipes of different sizes and lengths under different velocities of flow, and the discussion of these has enabled the approximate laws to be deduced which govern the loss of head in friction. These laws are:

1. The loss of head due to friction is proportional to the length of the pipe.
2. It increases with the roughness of the interior of the pipe.
3. It decreases as the diameter of the pipe increases.
4. It increases nearly as the square of the velocity of the flowing fluid.
5. It is independent of the pressure of the water.

Computations relating to the problem stated in the letter above have been made for the eight-inch pipe assuming a fairly smooth interior surface and flowing full at the following designated positions:

(a) Bottom of 45 degree sloping hill 500 feet high.

(b) In valley 1 mile from bottom of sloping hill.

(c) In valley 2 miles from bottom of sloping hill.

Position	Discharge (gallons per min.)	Loss of Head (feet)	Mean Velocity (ft. per second)
(a)	6200	463	39.5
(b)	2200	495	14.0
(c)	1530	497	9.5

The above computations are based on free flow at the designated points of discharge, and the dissipation of all the available head as friction in the pipe.

The frictional factor F varies not only with the roughness of the interior surface of the pipe, but also with its diameter, and with the velocity of flow. The probable error of the tabular values of F used for positions (b) and (c) is about five per cent, the effect of which will be the same on the computed values of "Loss of Head." For the computation at position (a) the probable error is much greater due to the great velocity and the use of an approximate factor of F in the absence of definite experimental data.

In order to properly answer your questions, more definite information on the condition of the interior surface of the pipe, construction of the

pipe line, loss at entrance from the spring, the available supply and the effect of temperature on discharge must be known.

Since you propose to install a turbine to utilize the potential power of this spring, it is suggested that you discuss this problem with a reputable turbine manufacturer. In a turbine installation, it is desirable to have a maximum head available at the turbine and the penstock is designed to provide this. A surge tank is usually provided to absorb pressure changes caused by shutting down the turbine. All of these factors are intimately associated with the design of the turbine and are beyond the scope of this reply.

Drillers In . . .

(Continued from page 9)

well-drilling firms. One of the original nucleus of Army drillers, he went to France in the early days of the war and escaped via Dunkirk. Incidentally he was wounded by a bomb fragment towards the end of the war period. The Army drillers put down in Britain about 120 holes, of 6 to 8 inches diameter.

The demand for drilling was pressing thoughout the whole of the war period. New airfields, camps and hospitals were continually being established; those for the use of the American Army in Britain, for example, were almost wholly supplied with water obtained by British engineering staffs, either from existing piped supplies, from surface sources, or, particularly in the eastern part of England, from underground sources. Over 200 boreholes between 12 ins. and 18 ins. diameter, and of an average depth of about 300 ft. (with a few going to 900 ft. or more), and with yields of 80,000 or 120,000 gallons per day were constructed under government contract for the supply of airfields, and almost as many, also under government contract, of similar holes, with some considerably larger, both in diameter and yield, for hospitals and factories. Other boreholes, for factories engaged on war work, were arranged by private contract.

The total number of holes, of 8-in. diameter or over, put down during the war period was probably in the neighborhood of 3,000. In addition, there were a great many smaller holes to provide water for constructional purposes, etc. Results have been extraordinarily successful, although there have, in the nature of things, been some failures.

In 1942 the drive for fuel led to the introduction of opencast working for coal on a large scale. This necessitated many thousands of shallow holes, which, while not connected with drilling for water, nevertheless occupied much skilled labor and many small rigs.

With regard to agriculture, the Ministry of Agriculture instituted in 1941 a system of grants to farmers to encourage them to improve the water-supply to farms, and several thousand farms benefited during the following years; but the very great majority of works undertaken consisted of connections to existing water mains, and others of harnessing local springs. New drilling for agricultural water supplies during the war was negligible.

All firms, large and small, suffered from two main difficulties, lack of skilled labor, and lack of transport facilities. These, combined with scarcity of casing and other equipment, rendered it quite impossible for drillers to undertake more than the smallest amount of sorely-needed work for agricultural development.

WIT BITS

A woman rushed in crying: "Doctor! Doctor! Come quickly. My husband has swallowed a mouse."

"Get back to him," said the doctor, "and try waving a piece of cheese in front of his mouth. I'll follow."

Five minutes later the doctor reached the house. A man was lying on a settee with his mouth wide open, while the hysterical wife was waving a kippered herring close to his face.

"You fool," the doctor shouted. "I told you cheese."

"I know that," she shrilled, "but I've got to get the cat out first."

LET'S TALK SHOP

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"Your girl is spoiled, isn't she?"

"No, it's just the perfume she's wearing."

Wife to sax-playing husband: "If you don't stop playing that thing I'll go crazy."

Husband: "I stopped half an hour ago."

An old lady who was introducing the new deacon to her husband who was a little deaf and a Republican.

"Darling," she said, "this is the new deacon."

"New Dealer?" murmured the old gent quizzically.

"No, my dear, not new dealer, new Deacon! New DEACON," she repeated. "He's the son of a bishop!"

Her husband shook his head sadly. . . . "They ALL are," he sighed.

"I'm crazy about your wife, McTavish, and if you'll let me have her I'll pay you her weight in gold."

"Let me have a few days first."

"To think it over?"

"No, to fatten her up."

Explorer: "And this bear on the floor here I shot in Alaska. It was a case of him or me."

Bored Listener: "Well, the bear certainly makes a better rug."

Minister presiding at a funeral: "Friends, all that remains here is the shell; the nut is gone."

She: "You deceived me before our marriage. You told me you were well off."

He: "I was, but I didn't know it."

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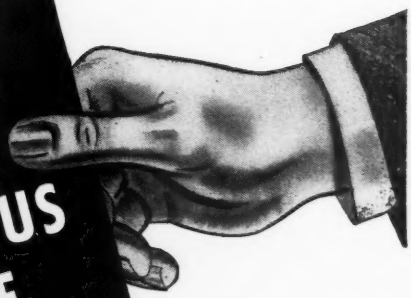

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BARGAIN COUNTER

To the reader who wishes to advertise used equipment in "Bargain Counter" Section.

All advertising in this section is payable in advance. Enclose your check or money order with copy. Rate: 30c per line. Minimum charge $1.20. No discounts, no commissions. Read these instructions carefully. The average line contains 28 characters (20 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number if blind advertisement is desired. Count your own copy to save delay. Holding up your advertisement one month to secure approval of revised copy or an additional remittance, may cost you real money in a lost sale. Be sure to enclose the correct amount of money with your order. Closing date — 10th of preceding month. Example — January issue closes December 10th.

To the reader wishing to answer "Bargain Counter" Section advertisements appearing on these pages:

Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of THE DRILLER, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

DRILLS FOR SALE

Keystone #70 V. belt-driven mounted on 1½ ton 5 speed trans. truck, both in good condition. Good cables, plenty of 6" tools. Ready to go to work. Price $4500. J. H. Nolan, 6 High Hill St., Greenville, S. C.

Armstrong 25 traction mounted drill. Without engine or tools. Can handle 2000 lbs. tools. Make me an offer. Box 114

Model "C" Ft. Worth spudder with extended frame. Buick eight motor, tire-mounted. 1000 ft. each of good ¾ drilling line and ½-inch sand line. 10, 8, 6, & 5-inch bits in pairs, three stems. Light plant, dog house and some fishing tools. $3500.00 complete. Box 116

One No. 71 and one No. 240 Star drills. Working every day. Harwoods — 13185 Ohio Ave., Detroit — Phone HOgarth 3035.

WANTED

Small, light water well drill capable of handling 250' to 300' work. C. M. Terrill, Cody, Nebraska.

WANTED

Truck mounted Bucyrus-Erie 22-W, Keystone 50, or Star 71. Box 118

All steel rig, 500-foot capacity. To drill 6" holes. With or without truck or tools. Box 113

One 4-inch, 5-inch and 8-inch Hoosier wall hooks, two pairs of 20-inch and 24-inch elevators. In answering give complete description, location and price. Box 120

HELP WANTED

Experienced driller. Sand or rock $1.25 per hour. Write Columbia Pump & Well Company. Washington 11, D. C. Must have car.

Driller wanted. Steady work, good wages. Modern equipment. Box 121

Experienced cable tool driller. One who can handle a drilling job to 12". Steady work, good wages. Box 123

HELP WANTED

Two drillers wanted to operate modern machines on large drift holes and deep lime holes in and around Detroit. Vast experience unnecessary. $1.50 per hr. or contract on holes. Write, state age. Michigan Well Drilling Co., 8 E. Court, Pleasant Ridge, Michigan.

Experienced driller to operate Bucyrus-Erie drill. Floyd B. Van Ingen, N. Chili, N. Y.

WANTED — by water well equipment manufacturer — salesman with drilling experience or practical knowledge of water well industry, for work in Eastern states. Young man preferred. Furnish full information and qualifications in first letter. Box 117.

Helper wanted, for drilling and pump work. G. I. training arrangements can be made. Box 122

Work Wanted

Experienced water well driller, cable tools, desires steady employment. Box 119

Floods Hit South

THE U. S. Department of the Interior and Geological Survey reports that runoff volumes for February were over twice normal in a six-state area extending from eastern Texas to northern Georgia.

In Mississippi severe floods occurred and only the lower reaches of streams draining the southern and central parts of the state escaped unusual high waters. The vicinity of Greenwood suffered the greatest flood damage and was practically isolated during the flood.

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